CLAIMS

1. A self energising friction clutch comprising;

a shaft [26] which is rotatable about its axis,

a clutch disc [14] which is concentrically fixed to the shaft [26],

engaging means [30,32] for disengaging and engaging the disc [14] from and with structure [12,76] adjacent the disc [14], and

an actuator [34] for moving the engaging means [30,32] between its disengaged and engaged positions of operation,

characterised in that;

the disc [14] engaging means [30,32] is a wedging arrangement [30,36,40] which includes a wedge member [30] one face of which rests on a first face of the disc [14] with its wedging angle [α] diminishing in the direction of rotation of the disc [14], and

a ramp formation [36,] which is fixed to the structure [12] and on which a second face of the wedge member [30,32], opposite its disc [14] face, is movable by the actuator [34] in the direction of rotation of the disc [14] between its rest position on the disc and a second position in which the disc [14] is locked by wedging action to the structure [12] with the locking force applied by the wedge [30] to the disc [14], during rotation of the disc [14], being substantially greater than the locking force created by the actuator [34] with the disc [14] stationary relatively to the structure [12].

2. A clutch as claimed in claim 1 wherein the wedging arrangement includes a reaction formation [40] which is fixed to the structure [12] and which, in the disengaged position of the wedge [30], rests on the second face of the disc [14] opposite the wedge [30] and, which together with the wedge [30], lockingly clamps the disc [14] between them in the disc [14] locking position of the wedge [30].

3. A clutch as claimed in claim 2 wherein the coefficient of friction of the first face of the wedge member [30] on the disc [14] is greater than that of its second face on the ramp [40]

formation so that the lower frictional resistance to movement of the wedge member [30] on the ramp [40] will amplify the wedging effect of the wedge [30].

4. A clutch as claimed in either one of claims 2 or 3 for coupling a second rotatable shaft [24] in axial register with and to the disc shaft [26] wherein the structure is a housing [12] in which the disc [14] is rotatable, the second shaft [24] is fixed to and projects from the housing [12], and the actuator is a pin [34] which is movable in its axial direction through a wall of the housing [12] in a direction normal to the disc 14 face and includes on its end in the housing a head [44] having a formation which bears on an inclined end surface of the wedge member [30] and means [50,52] for moving the pin [34] to cause its head formation [44] to move the wedge member [30] in the direction of rotation of the disc [14], in use.

5. A clutch as claimed in claim 4 including at least two wedge arrangements [30,36,40] and their actuators [34] which are equally spaced from each other on a path on the disc [14] which is coaxial with its axis of rotation.

6. A clutch as claimed in either one of claims 4 or 5 wherein the or each disc engaging means includes two wedge arrangements [30,36,40 and 32,38,42] which are arranged in the housing [12] in a back to back relationship with the wedging angles [α] of the wedges [30,32] facing in opposite directions on a common path of rotation on the disc [14] with the actuator pinhead [44] including two oppositely facing formations which each bear on an inclined end surface of a wedge member [30,32] of the pair of wedge members so that on activation of the pin [34] by its moving means [50,52] one of the wedge members [30,32] of the or each pair of wedge members will be caused to lock the disc [14] in a first direction of rotation and the other in the opposite direction of rotation.

7. A clutch as claimed in any one of claims 4 to 6 wherein the or each pinhead [44] formation is a flat surface which is engaged with and complementally angled to the end surface of the wedge [30,32] on which it bears.

8. A clutch as claimed in any one of the above claims including means for biasing the or each wedge member [30,32] in a direction opposite the direction of rotation of the disc [14], in use.

9. A clutch as claimed in any one of claims 4 to 8 wherein one of the surfaces between the pinhead formation [44] and end surface of the wedge member [30,32] on which it bears is faced with a material having a low coefficient of friction.

10. A clutch as claimed in any one of claims 4 to 9 wherein one of the interface surfaces between the or each wedge member [30,32] and its ramp formation [40,42] is faced with a material having a low coefficient of friction.

11. A clutch as claimed in any one of claims 4 to 8 wherein the friction interfaces of the clutch components in the housing [12] operate in a traction fluid in the housing [12].

12. A clutch as claimed in any one of claims 4 to 11 wherein the actuator pin [34] moving means is an electro magnet.

13. A clutch as claimed in any one of claims 4 to 11 wherein the actuator pin [34] moving means is a hydraulic piston and cylinder arrangement.

14. A clutch as claimed in any one of claims 4 to 13 including an activating ring [50] which is centred on the clutch axis with a first face [60] of the ring [50] bearing on the free end of the or each actuator pin [34] on the outside of the clutch housing [12] and which is slidably located and held against rotation in fixed structure adjacent the clutch housing [12] with the pin [34] moving means [52] being adapted to move the ring [50] towards and away from the clutch housing [12].

15. A clutch as claimed in claim 14 wherein the or each actuating pin [34] is spring [48] biased onto the activating ring [50].

16. A clutch as claimed in claim 15 which is used as an angular velocity extraction device in a constant velocity transmission machine with the second face of the activating ring [50] including at least one outwardly projecting cam formation [56].

17. A clutch as claimed in claim 16 including a driver unit [52] which comprises a transmission wheel [62] which is rotatable on the second shaft [24] and at least one formation [74], which projects from the wheel [62] in its axial direction, which bears against and is cam following on the second face of the activating ring [50].

18. A clutch as claimed in claim 17 wherein the transmission wheel [62] is a gear wheel which, in use, is gear driven.

19. A clutch as claimed in claim 17 wherein the transmission wheel [62] is a pulley which is adapted to be belt driven.

20. A clutch as claimed in claim 3 which for use as a motor vehicle disc brake wherein the shaft [26] to which the clutch disc [14] is fixed is a rotatable wheel shaft of the vehicle, the structure is a U-shaped housing [76] which, in use, is attached to fixed structure adjacent the disc [14] and in which the wedging arrangement [30,36,40] is located with the wedge member [30] and the reaction formation [40] serving as the brake pads and the engaging means is a piston and cylinder arrangement.